

Brule River State Forest Master Plan Variance: No Action option

March 12, 2004

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Introduction

Several factors must be considered if no action is chosen as a response to the Brule River State Forest Variance request. The variance outlines salvage and regeneration plans for two areas, Area 2 Sugar Camp Hill and Area 8 Brule Tower. This variance was originally requested in response to dieback and mortality of the oak resource as a result of drought, defoliation and subsequent infestation by the two-lined chestnut borer, *Agrilus bilineatus*. If no action is chosen as a response to this request, the following impacts must be considered: economics, two-lined chestnut borer populations and forest health, forest regeneration, and development of old-growth characteristics.

1) Economic loss

If the standing dead and dying oaks are not salvaged, the economic value of these trees will not be realized. Even if the trees are salvaged at some time in the future, secondary wood borers including those in the families Buprestidae, Scolytidae and Cerambycidae are all likely to bore into the dead trees at various depths (Haack and Benjamin, 1983). Some will have a minor effect on the product; some could cause significant degradation. If the trees are allowed to stand dead for more than a year, they will lose moisture; cracking and splitting will occur upon felling. This will reduce the grade of the logs by either one or two levels, which will have a significant impact on their value.

2) Two-lined chestnut borer population

Oak trees on these sites are dying from a combination of drought, defoliation by the forest tent caterpillar and subsequent infestation by the two-lined chestnut borer. The relationship between predisposing stress factors and successful infestation by this insect has been studied (Dunn and Potter, 1990; Haack and Benjamin 1982; Muzika, Liebhold and Twery, 2000). These studies support the hypothesis that oak predisposed to drought and/or defoliation is more susceptible to successful attack and subsequent dieback and mortality.

The two-lined chestnut borer overwinters in a pupal cell in the outer bark as a fourth instar. This insect will emerge in late May to early June. If infested trees are not cut before adults emerge, an opportunity to reduce the number of emerging adults will be lost. The impact of this emerging population is difficult to predict and dependent on the health status (root starch level and water potential) of trees that may be attacked by this emerging population. In general, oak of poor or declining health shows symptoms of dieback (mortality of branches in the upper and outer portion of the crown). Recent work by Muzika, Liebhold and Gottschalk (1997) showed a relationship between higher abundance of two-lined chestnut borer adults and increased mortality of overstory oak occurred in some stands but not others. They speculated successful infestation was more closely correlated with the health status of trees under attack than the population level.

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Further work by Muzika, Liebhold and Twery (2000) explored the relationship between defoliation, thinning of oak stands and population levels of the two-lined chestnut borer. Defoliation, regardless of thinning, was the factor associated with the highest increase in populations of the two-lined chestnut borer. There is very little data on how far adults may fly but this same study demonstrated that two-lined chestnut borer activity may be relatively limited temporally and spatially, and that abundance in a given area does not necessarily lead to large increases.

In summary, if infested trees are not cut, they will serve as a source of emerging adults, that may or may not successfully infest remaining oaks on the Brule River State Forest and surrounding properties. The impact and success of further infestations depends largely on the health status of trees under attack.

3) Regeneration of the forest stands

Tree mortality has resulted in open forest stands with very low stocking; by traditional forestry measures these stands have become understocked and are not fully utilizing the sites' growth potentials. Full stocking can be expected to develop naturally (without direct human intervention), but timing and composition are uncertain, depending on variable environmental factors. The amount of time required for the establishment of vigorous and abundant tree regeneration, and eventually a young, fully stocked stand, would likely require many years (10-50 years) due to competition from scrub trees, shrubs, ferns, herbs, and grasses. Specific compositional objectives are unlikely to be met.

In Area 2, ironwood, red maple, fir, and brush (hazel, blackberries) are likely to become dominant in the near future. Longer term, dominance of the next stand by red maple and perhaps fir could be expected. Associates would probably include poor quality mesic hardwoods and a few oaks. In Area 8, brush (hazel, blackberries) and poorly stocked and scrubby oak and red maple are likely to become dominant in the short-term; over an extended period of time oak and red maple should be able to work through the brush and eventually establish poor quality oak and red maple stands. In both areas, no action will probably result in the maintenance of an open, understocked forest during the short- to mid-term future, and eventual, slow development of a well-stocked forest of potentially undesirable species composition.

Silviculture is the manipulation of forest vegetation to achieve landowner objectives. The application of silvicultural methods can facilitate the relatively rapid establishment of vigorous and abundant regeneration of desirable species composition. No action forfeits this opportunity and increases uncertainty.

4) Development of old-growth characteristics

The Wisconsin DNR defines old-growth at the stand and landscape level. The stands under consideration are not old-growth and could not meet old-growth (or old forest) definitions or designation criteria whether salvaged or not. These stands have become severely understocked due to tree mortality. Remaining trees and other structural elements are becoming biological legacies (of the previous stands); these legacies can then become part of the proximate stands. However, these proximate stands will be defined and dominated by the regeneration that develops in the near future (not by the legacies of past stands). The advanced stand ages required for old-growth or old forest designation will not be attained for a century or more. Nevertheless, retaining

biological legacies (e.g. coarse woody debris, snags, reserve trees) can provide ecological benefits; they can provide habitat niches for species that preferentially utilize such habitats.

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